

Commentary

Delivering Environmental Justice through Environmental Impact Assessment in the United States: The Challenge of Public Participation

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Abstract: The United States (US) occupies the frontline of events in modern history of environmental reform. The federal government through the National Environmental Policy Act (NEPA) of 1970 has not only established an environmental policy template for other nations to emulate, but has also produced a viable tool for regulating environmental quality (EQ) and delivering environmental justice (EJ)—Environmental Impact Assessment (EIA). However, environmental history provides evidence that political process and special interests govern the attainment of the EJ goal by way of inadequate adherence to the NEPA provisions. Public participation (PP) is a principal requirement for achieving EJ and constitutes a pivotal determinant of EIA outcome. Effective delivery of EJ through EIA does require complete compliance with NEPA stipulations. Furthermore, the responsible agency's resources in terms of both funding and commitment in allowing for the full representation of the opinions of residents within communities of concern (CoC) for environmental decision-making process are critically important. Public health research approach offers valuable tools towards achieving EJ goals. To approach this topic, first I provide a historical background on EIA and EJ from the standpoint of the NEPA. Second, I discuss the meaning and impediments of PP. Third, I examine two scenarios viz the Triassic Park Hazardous Waste Dump in Roswell, and the public hearing of the recent “controversial” oil and gas ordinance in Sandoval County, both in New Mexico. Finally, in the discussion part, I attempt to evaluate PP in both cases and suggest that none of the criteria seem to have been met in either case. I conclude that the Home State Rule designation of New Mexico State in terms of control over oil and gas activities places it at an advantage in benefitting from a fair PP.

Keywords: communities of concern; environmental health; environmental impact assessment; environmental justice; environmental policy; National Environmental Policy Act; public participation

1. Introduction

In the past decades, advancement in science and technology has considerably increased anthropogenic activities that pose significant threats to the environment and public health. Similarly, global population growth has substantially increased with a corresponding rise in the levels of pollution from human-related activities [1]. This has resulted in increased rates of morbidities and mortalities arising from anthropological causes [2].

The World Health Organization (WHO) [3] estimates that of the total deaths that occurred in 2012, 12.6 million resulted from residential and occupational exposures to environmental hazards, including risks of human-related sources. More importantly, the poor are disproportionately affected [4]. Accordingly, societies across the world have realized the essentiality of safeguarding the environment and promoting EQ, due to its very crucial role in public health. Sustaining EQ has thus become a national priority for many nations, irrespective of their level of development [5].

In the United States (US), the task of preserving EQ has since the past few decades become a pressing one. In fact, the US government recognizing the significance of this official target pronounced in the Environmental Health goal of Healthy People 2020 “promote health for all through a healthy environment” [6]. The natural or physical environment (air, soil, water), and the social environment (agriculture, housing, land use, transportation, industrial facilities) serve as avenues through which humans are exposed to environmental hazards (biological, chemical, and physical) [1,7].

To address the environmental consequences of man’s exploitation of natural resources, several democracies across the globe have adopted various approaches [8]. Environmental Impact Assessment (EIA) constitutes one of the most prominent among such methods. As a legislative framework, many nations have adopted EIA in regulating human environmental impacts, preserving natural resources, and assuring public health safety [9]. Over time, several forms of EIA having fundamentally similar operational procedures developed from EIA. Such EIA “products” include Health Impact Assessment (HIA), Sustainability Impact Assessment (SIA), Strategic Environmental Assessment (SEA), and more recently, Integrated Environmental Impact Assessment (IEIA). These are adopted to “more adequately” address specific topics, where EIA is considered restricted in holistically addressing economic-, health-, social-, and sustainability-related matters, in addition to those of the environment [10–12].

The US congress established federal agencies such as the US Environmental Protection Agency (EPA) as principal custodians of the environment, and charged them with the responsibility of administering the country’s environmental policies. These agencies conduct research, help develop and enforce environmental health laws that protect EQ, as well as secure ecosystem and population health [1]. Although these legislations have appreciable potential to enhance and sustain EQ, political process alters, and sometimes undermines, them. Their implementation is therefore subject to the influence of the opinions of different administrations and special interests. Furthermore, implementing these policies often entails trade-offs—economic considerations including preserving employments for the populace, and the expectation of increased taxation balanced against environmental protections. In some cases, these considerations have resulted in unbalanced or unfavorable compromises that ultimately hinder implementation of, as well as compliance with the provisions of established regulations. More often than not, this is to the detriment of the communities of concern (CoC). CoC refers to neighborhoods or populations having high risk of being adversely impacted by a proposed or ongoing environmentally significant project. Such situations present challenges to achieving EQ goals.

This paper focuses on the significance of public participation (PP) as a principal step in environmental decision-making process required in delivering environmental justice (EJ). The discussion is divided into four parts. First, I provide a concise discussion on three fundamental concepts, namely the NEPA, EIA, and EJ, and their interrelationships and significance in PP. My concern here is to relate EJ with environmental health equity, emphasizing the high-priority of inputs of residents of CoC in environmental decision-making. This is important considering the fact that they bear the brunt of such decisions following project implementation. I highlight the significance of the EPA’s role in prioritizing EJ, and the inherent merits of environmental public health protection. Next I provide an overview of PP. The emphasis in this section is principally to highlight the criticality attached to PP from a global perspective with particular reference to international conventions, including the 1992 Rio Declaration and 1998 International Aarhus Convention. This part also places emphasis on the reorganization of power and structure of decision-making to include inputs from CoC. Barriers to achieving an equitable PP are also discussed in this section.

The third part of the paper addresses oil and gas development including unconventional oil and natural gas drilling in New Mexico which houses the case study areas. The focus here is on three main aspects—(i) New Mexico’s dependency on oil and gas industry is based on the fact that significant amount of General Funding for public schools, road repairs, and public works is derived from the industry; (ii) inadequate governmental enforcement of environmental health legislations pertaining to oil and gas drilling risks have “pushed” many local communities to apply proactive control over oil

and gas operations in their neighborhoods; (iii) state and local ordinances, including Dillon's Rule and the Home State Rule, play very prominent roles in the empowerment, and consequently, municipalities and counties control over the activities of oil and gas industry within their jurisdictions. Also, in this part, to illustrate instances of situations where PP may not have been equitably performed, I first briefly discuss the recent public hearing in Sandoval County, New Mexico, then took a retrospective view of the Triassic Park Hazardous Waste Dump near Roswell, also in New Mexico. PP issues are highlighted.

I conclude my discussion by "putting the pieces together", essentially discussing how the Home State Rule places New Mexico at an advantage in instituting legislations that can significantly prioritize PP on the one hand, and control the activities of the oil and gas companies on the other. This last part of the discussion also presents a table of evaluation criteria and an attempt to evaluate PP in both scenarios: Sandoval County and the Triassic Park Waste Dump. I find that there was no basis for evaluation, seeing that practically none of the listed criteria were met.

2. NEPA, EIA, and EJ

Through its NEPA of 1970, as well as subsequent legislations, the US initiated and guided inventive models of environmental policy for other nations across the world [13]. Following the NEPA promulgation, various international forums, such as the World Bank (WB), the United Nations Environment Program (UNEP), and the Organization for Economic Corporation and Development (OECD) made the NEPA EIA provisions official [14].

Environmental policy affords governments and businesses a platform for itemizing and achieving their environmental goals and objectives. Along these lines, the NEPA demands that for projects having the potential of significantly affecting the environment, EIA must be conducted prior to project design. This enables appropriate regulatory agencies to decide whether to issue permits or deny applications for implementation of proposed environmentally significant projects [5].

EJ is central to achieving the NEPA goals. The EPA emphasizes EJ's significance and the agency's commitment to delivering it by declaring "EJ is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to development, implementation and enforcement of environmental laws, regulations, and policies". It further asserts, "Fair treatment implies that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. Meaningful involvement implies that: (i) people have an opportunity to participate in decisions on activities that can affect their environment and/or health; (ii) the public's contribution can influence the regulatory agency's decision; (iii) their concerns will be considered in the decision-making process; and, (iv) the decision makers seek out and facilitate the involvement of those that are potentially affected. The EPA has this goal for all communities and persons across the US. It will be achieved when everyone has an equal amount of protection from environmental and health hazards, as well as equal access to a decision-making process to have a healthy environment in which to live, learn and work" [15].

Like some other developed nations, including Scotland, the US employs EIA in the execution of EJ [16,17]. The NEPA stipulates that provisions be made for populations within CoC to be included in the environmental decision-making process for all federal, state, and local projects that may potentially impact environmental public health. Through its EJ programs, the EPA has successfully addressed EJ issues in CoC like Tonawanda, an Indian reservation in New York, and a number of similar communities [18]. Nevertheless, research suggests that a crucial aspect of the EIA process that enhances achieving EJ is sometimes under prioritized—PP in environmental decision-making process [19]. The goal of PP is to increase the fairness, validity, legality, scope, and superiority or value of EIA. Although some researchers [20,21] argue that PP is inadequate to produce expected deliverables, others propose that it serves an important tool for the purpose if well conducted [18].

3. PP

According to the World Bank [22], participation is “a process through which stakeholders influence and share control over development initiatives, and the decision and resources which affect them.” Principle 10 of the Rio Declaration on environment and development [23] formalized public participation in 1992. It sets out three major human rights: access to information, justice, and public participation as key pillars of a potent environmental governance. Principle 10 also states, “Environmental issues are best addressed with participation of all concerned citizens . . . At all levels, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available . . . ” (p3.). Along similar lines, other international legislations such as the 1998 International Aarhus Convention asserts “Citizens have the right to participate in a range of decisions where there may be an environmental impact” [24].

PP also refers to the various formal processes by which concerns, needs, and values of the public, including stakeholders and CoC, are included throughout the entire governmental decision-making process [25]. Thus, PP is not a one-time event, but rather, a succession of sponsor agency actions or events occurring throughout the project life to both inform and educate the public, as well as obtain inputs from them [26].

According to O’Faircheallaigh [27], the purpose of PP, broadly put, includes alteration of the power and structure of decision-making to include inputs from the CoC residents, making them partake of the entire decision-making process from planning through development and implementation. These broad goals lead to “social goals” [28]—beneficial outcomes of the PP process which exceed the immediate interests of stakeholders. They include building trust, educating the public, incorporating public values and knowledge into decision-making, reducing conflict, and assuring cost-effective decision-making.

Expounding on an earlier definition in a prior paragraph in this paper, CoC refers to communities that are either suspected of, or actually having, unequally high levels of exposure to environmental burden or stressors. These stressors include various factors with the potential of affecting human health including toxicants, like pesticides and other chemicals. They also include light, noise, odors, and particulate matter. Furthermore, populations within CoC fall under the category of people having limited access to education and health care. Populations that are of low socioeconomic status, members of an ethnic or racial minority group, and politically marginalized groups fall under CoC [29].

Barriers to Public Participation

Successfully achieving PP goals demands that the process is equitable. Unsuccessful PP process can elicit perceptions of marginalization from a political system and planning process. It can also evoke hostility, protests, lawsuits, and increased disintegration among people within a CoC [30]. Working towards achieving PP goals right from the outset is therefore critical. Nonetheless, despite the extensive acceptance of PP and its benefits, it still faces many barriers. Obstacles on the part of the sponsor agency include lack of financial and staff resources, PP skills among staff, time, as well as problems associated with aligning with the priorities of elected officials. Comparably, problems associated with CoC, include cultural/language barrier, public cynicism or distrust of the planning process, lack of interest in the process, inaccessibility to meeting locations, insufficient and untimely disseminated information, and planning unawareness or incomprehensibility [31,32].

4. New Mexico Case Study

4.1. Oil and Gas Reserves

New Mexico contains very substantial quantities of fossil fuel, mineral, and renewable energy resources [33–35]. Due to its petroleum, natural gas, natural gas liquids, and coal production, the state

constitutes the nation's seventh-largest net supplier of energy [36,37]. In terms of the number of producing oil and natural gas leases on federal land, it is second only to Wyoming [37,38]

The Permian Basin, which sits partly on West Texas and Southeastern New Mexico, constitutes one of the most productive oil provinces in the nation [39,40]. The part of the Basin on New Mexico side has about 26,000 oil wells and contains two of the nation's 100 largest oil fields [40,41]. The state's oil production has remained reasonably steady for several decades, and has more than doubled since 2009. New Mexico's proved reserves increased more than double during the same period [41,42].

The oil and natural gas industry revenue funds 30% of the state's General Fund, providing nearly \$1.5 billion for essential state services like schools, road repair, and public works in 2010 [43]. New Mexico ranks third among states with the largest amount of tribal acreage after Arizona and Alaska [44]. Two of its largest reservations—the Navajo Reservation and the Jicarilla Apache Reservation—occupy the oil- and gas-rich Four Corners northwestern region of the state [44]. The Jicarilla Apache Reservation is a hydrocarbon-rich area on the east flank of the San Juan Basin within the Four Corners region. It is the largest mineral rights owner in the basin after the federal government. Several oil and gas fields are located within its premises [45,46]

The forgoing explains why the oil and gas industry is such a vital part of the state's economy, and of the nation as a whole. It also underscores the significance of environmental and natural resources conservation, protection of CoC, as well as public health and safety.

4.2. Oil and Gas Development and Environmental Regulations

Unconventional oil and gas drilling through hydraulic fracturing and horizontal drilling increased in the US since 2000. This has had a plethora of environmental, health, and social consequences that have mostly affected communities at the local level [47,48]. Multiple research studies across the US have proven statistically significant correlation between natural gas drilling and fracking and ground and surface water contamination by various chemicals [48].

Currently, fracking is exempt from numerous required federal laws, including the Safe Drinking Water Act (SDWA), Clean Water Act (CWA), Clean Air Act (CAA), Comprehensive Environmental Response Compensation Act (CERCLA), Resource Conservation and Recovery Act (RCRA), and Toxic Substance Control Act (TSCA) [49]. According to Richardson et al. [50], the regulation of fracking, oil/gas development, and wastewater disposal among states fails to adequately address the inherent risks that are involved due in part to inadequate regulations lacking a precautionary component, and ineffective monitoring. Consequently, a vast majority of communities having a prospect of a local oil/gas boom have adopted more proactive approaches to exert control over the activities of the oil and gas industry within their neighborhoods [51]. Such strategies include zoning ordinances, community bill of rights, regulations, such as conditional use permits that limit or place conditions on oil/gas activity, and local moratoria on hydraulic fracturing, by drawing on local government police powers to protect community health, safety, and welfare [52].

4.3. State and Local Ordinances

The US federal constitution is reticent on matters regarding local government authority on oil and gas development. States therefore have the judgement of determining local government jurisdictions. There are two main models of local government authority in the US viz the Dillon's Rule and the Home State Rule [53]. The former states that local governments can only appropriate powers specifically allotted to them by state statutes. Under this rule, local governments' authority is subdued by state legislature in matters relating to oil and gas development [53]. In contrast, the Home Rule affords counties and municipalities the power to exercise regulatory authority that is void of state statute restrictions. In other words, they have the power to compose and alter their own charters in as much as they are not in conflict with the provisions of state statutes. They can also assert any power or function that is not clearly invalidated by the State constitution, the legislature, or their own home rule [54,55]. Additionally, in favor of local government, state legislatures are often not all-encompassing, thereby,

leaving ample room for the creation of contemporaneous local government jurisdictions to supplement state laws [56].

The New Mexico Constitution [54,57] categorizes the state as a Home Rule state. This implies that broad powers are conferred on local governments through a Constitutional provision and the power to adopt charters conferred to local governments through state law.

The New Mexico Constitution declares “A municipality which adopts a charter may exercise all legislative powers and perform all functions not expressly denied by general law or charter” [57]. A home rule amendment in 1970 broadened the interpretation of these powers further: Article 10, section 6, subsection E of the state constitution states: “The purpose of this section is to provide for maximum local self-government. A liberal construction shall be given to the powers of municipalities”. This applies to Santa Fe County and the Galisteo Basin (including portions of San Miguel and Sandoval Counties), which can enact supplementary environmental regulations more stringent than state laws. It is therefore possible for County governments to exercise this “exclusive” authority to enact legitimately valid or justifiable oil and gas regulations that can be more stringent than state regulations, such as constraining the use of synthetic chemicals in fracking fluid, while state law permits its use. In contrast, other regions of the state do not have this unique ability to prohibit an Act that is permissible by a state ordinance, but can only enact environmental regulations that supplement, but do not conflict with state regulations [55–57].

4.4. Specific Cases of “Inequitable” PP Process

4.4.1. Sandoval County

The recent PP in Sandoval County New Mexico where the decision-making process excluded opinions of a significant number of residents provides a good example of failed PP—the opinions of approximately 200 residents who participated were not given due consideration. Furthermore, according to reports [58,59], the PP process did not take into account the opinions of about 75 residents who could not gain access to the venue of public hearing due to insufficient space. The Sandoval Commission voted 4-1 in favor of a “controversial” oil and gas legislation. It is stated that under this ordinance, there is the probability of a single official deciding without public notice or hearings, the siting of oil wells. Consequently, drilling in close proximity to homes, schools, and hospitals is probable. Additionally, public water supply stands the risk of contamination by drilling chemicals [58,59].

4.4.2. Looking Back in History: Triassic Park Hazardous Waste Dump near Roswell

The problem of conducting PP in a “fair” manner is not a new development in New Mexico [60]. In 2002, 3 grassroots environmental groups namely Citizens for Alternatives to Radioactive Dumping (CARD), Water Information Network (WIN), and Conservative Use of Resources and the Environment (CURE), filed a civil rights complaint against New Mexico Environment Department (NMED). The complaint alleged that in the approval of the Triassic Park Hazardous Waste Dump near Roswell, NMED failed to ensure equitable PP for community residents, particularly people who spoke non-English languages [60]. The Southeastern New Mexico population is poor and unable to afford the luxury of public meeting attendance. Furthermore, they consider their communities as a sacrifice jurisdiction for hazardous waste dumping industries. According to report [60], NMED complained about cost of translating documents, and expected that information posted on their website was adequate for informing the public.

5. Discussion

5.1. Putting the Pieces Together

The Oil and natural gas industry is very critical to New Mexico State economy. Considering the fact that its revenue provides an appreciable amount of the State's General Fund places it even higher on the priority list. Consequently, unconventional oil and gas drilling has become "indispensable" in oil and gas development. Moreover, hydraulic fracturing in particular, has amplified the economic viability and oil/gas production capacity in ecologically sensitive areas in both urban and rural US [56]. However, when EIA for oil prospecting projects fail to take into account the full breadth of formalized PP requirements, issues may be compounded beyond existing problems that are associated with hydraulic fracturing regulations.

In addition to the advantage of home rule authority, New Mexico municipalities and counties also possess significant authority to legislate laws for the protection of public health and welfare. Under N.M. Stat. § 3-17-1, municipalities can impose ordinances that are "not inconsistent with the laws of New Mexico" to afford residents safety, health, and prosperity, or provide order for the municipality. Similar powers are afforded counties by the provisions of N.M. Stat. § 4-37-1. Furthermore, municipalities have planning and zoning authority that goes beyond approximately five miles exceeding the municipality's jurisdiction into the surrounding county [56,61].

States operating under the Home Rule model enjoy significant discretion to impose local authority in as much as they do not encroach on state statutes, or expressly vetoed by state laws. Further, a Home Rule state can exert substantial limitations on local government power through explicit constitutional or statutory language. Ohio provides a very good example—local governments are explicitly deprived of the power to "place land use limitations on drilling for oil and gas" under the state's oil and gas law [52]. Unlike Ohio, New Mexico, remains a Home Rule State where state legislatures do not significantly subvert local government power in the execution of authority regarding oil and gas development [52,56].

Given the privileges afforded it by the Home Rule model, zoning ordinances to prohibit oil/gas exploration, and several other ordinances, New Mexico has considerable local authority to control the activities of the oil and gas industry in terms of environmental public health and safety. Within these provisions lies the authority to channel or translate the inherent powers into executing equitable PP. Sandoval County falls within the jurisdiction that enjoy such privileges [51,52,56].

5.2. Evaluating PP in the Two Scenarios

Several authors have provided templates for evaluating PP. For the purpose of this study, I refer to Wouters et al. [62] template (Table 1).

Based on the available information on both cases, and the criteria highlighted in Table 1, it is pointless to attempt to evaluate their performances. The January 2017 EPA letter [63] to NMED expatiated the various loopholes that require redress in agency execution of PP.

Following the 2002 suit, the Triassic Park Dump Project gradually grew faint from public attention, until 2011 when Gandy-Marley, Inc (GMI) resumed negotiations for its permitting process, which until now, is ongoing. The recent announcement that the EPA stepped into the Triassic Park case, reaching an informal agreement with NMED is highly commendable. According to the letter dated 19 January 2017, in August 2016, the EPA, in an attempt to resolve the complaint and several other EPA-identified anomalies in the practices of NMED regarding this particular case, demanded several requirements to be met. Prominent amongst these is the expansion of PP in Triassic Park permitting process by way of furnishing CoC more and necessary information in Spanish. In addition, NMED is required to allow more time for rural communities in Chavez and Lea Counties to gain significant grasp of both the permitting process and the project itself [60,63].

Table 1. Evaluation Criteria for public participation (PP).

S./No.	Criterion	Definition
1.	Representation	Public participation must comprise a broadly representative sample of the population of the affected public.
2.	Influence	Issues of concern to the public, and relevant to the decision at hand, must be taken into account in reaching a decision.
3.	Timeliness	Realistic milestones and deadlines must be managed throughout the process.
4.	Purpose and decision making	The participation process must be driven by a shared purpose, with the nature and scope of the participation task clearly defined.
5.	Early involvement	The public must be involved early. This involvement extends onwards throughout the planning process.
6.	Effective forums	The public must be able to participate in an effective forum. A variety of techniques is used to give and receive information, including face-to-face discussion between parties.
7.	Information	Public participation provides participants with the information that they need to participate in a meaningful way.
8.	Enabling process	The process for public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision.
9.	Feedback	The public participation process communicates to participants how their input affected the decision.

The EPA also requested that NMED satisfies dozens of specific procedural requirements not only pertaining the Triassic Project, but also for NMED's permitting practices for all other projects. EPA expressly requests that NMED appoints a non-discrimination coordinator to oversee the application and permit issuance procedures. In response, NMED assented to the creation and execution of PP policy that extensively increases both agency's dialogue with, and opportunities for CoC to participate. Also included in the agreement is the requirement for NMED plans to include access to both persons with disabilities and limited English language competence. The agreement also demands NMED staff training to allay future discrimination issues.

Posting notices on the agency's website may not be an effective way to gather or disseminate information in PP process [60]. Although the internet due to its unlimited coverage where access is available, serves as a valuable remote tool for informing the public, it bears the disadvantage of literacy issues. This may be overcome by using voice and video. Nevertheless, the issue of "digital divide" prevails, as the number of people with internet access within CoC is substantially less than the entire public [60].

The Sandoval County situation probably highlights the impediments, including the inadequacy of stakeholders' communication forums, PP impact on decisions; lateness in public involvement; and technocracy associated with traditional PP methods [64]. Research finds that innovative citizens' involvement prove more effective in overcoming such inherent shortcomings of traditional methods. Innovative PP approaches engage citizens through citizens review panels, community advisory boards, community-based collaborations, and online discussion forums [64]. Successful PP is influenced by the diversity of engaged participants, their involvement in the early stages of the participatory process, the level of interaction among members of CoC and between all other stakeholders, as well as the degree to which participants opinions influence the responsible agency's decision. Furthermore, agency funding and availability of resources determine success of PP.

5.3. Public Health Research

Interest in collaborative approaches particularly as community-based participatory research (CBPR) has significantly increased in public health research in modern times. CBPR refers to the compendious description of a variety of approaches directed towards community capacity building in addressing health issues at the local level [65–67]. This is a very vital public health research strategy whose fundamental tenets lay emphasis on coordinated and concerted process involving proportionate inputs from community members and researchers. Research activities including data collection, analysis, and ensuing action are guided by community members.

The intent of CBPR is to upend long-established or classical power inequality between both participating sides—researchers and community members, in this case. This is accomplished by promoting local ownership over research and enforcing political and social equality of knowledge. Another very crucial purpose of CBPR is to organize and use the acquired knowledge in advancing social change and improve public health [66,68]. The overarching goal of CBPR is to divest power and ensure equity with regards to participation throughout the entire process from project planning to execution [69–71]. Research suggests that in recent years, vast public health issues in community settings have been addressed by unified groups, organizations of concerned citizens and institutional partners [72]. PP will significantly benefit from public health research approach vis a vis CBPR.

6. Conclusions

The US provides an excellent template for comprehending and establishing successful environmental policy globally. Contained within the provisions of the NEPA is a diversity of legislations that serve to address environmental public health issues. However, a complexity of multiple factors influence the successful implementation and achievement of the NEPA goals. For example, in the context of the NEPA, EIA serves a valuable tool for actualizing EJ. However, much as EIA success depends on the extent of achievement of EJ goals, so does EJ success on PP. To the best of my knowledge, the success of EIA is measured by a myriad of factors, including the broad components of PP.

In practice, EIA tends to be successful when its framework affords a platform for all stakeholders, including residents of CoC, to understand relevant issues that are associated with the proposed project. This often leads to increased communication that yields mutual confidence and reliance among stakeholders. Furthermore, agency's recognition of all the interests and worth of residents within the CoC, as well as consideration of these as vital in the environmental decision process, are also key. Identifying all possible alternatives, including “no action” also enhances the overall environmental decision making-process. Are the stipulations of appropriate regulations pertaining EIA and its various components, including the PP process followed? This determines how participants adjudge the fairness and legality of the process. Sincerity and transparency on the part of the responsible agency improves the overall environmental decision-making process and reduces disputes.

Another vital aspect that determines the success of the EIA is funding. Inadequate agency's resources to perform the required work results in skewed assessment outcome, irrespective of how good the framework may appear.

Indeed, based on local authority, New Mexico has substantial “incentives” to regulate the activities of the oil and gas industry, particularly with respect of public health protection. This also include discharging equitable PP process within CoC. In states like New York and Pennsylvania where Dillon's Rule prevails, certain states ordinances have been substantially amended so as to grant local government significant powers to legislate and implement local ordinances that benefits CoC.

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References

1. Friis, R.H. *Essentials of Environmental Health*, 2nd ed.; Jones & Bartlett Learning: Sudbury, MA, USA, 2012; p. 14.
2. Narain, J.P. The Challenge of Health and Environment: Profiling Risks and Strategic Priorities for Now and the Future. *Indian J. Med. Res.* **2012**, *136*, 185–191. [PubMed]
3. World Health Organization (WHO). An Estimated 12.6 Million Deaths Each Year Are Attributable to Unhealthy Environments. Available online: <http://www.who.int/mediacentre/news/releases/2016/deaths-attributable-to-unhealthy-environments/en/> (accessed on 26 October 2017).
4. World Health Organization (WHO). Air Pollution Levels Rising in many of the World's Poorest Cities. Available online: <http://www.who.int/mediacentre/news/releases/2016/air-pollution-rising/en/> (accessed on 23 July 2017).
5. Bekhechi, M.A.; Mercier, J.R. *The Legal and Regulatory Framework for Environmental Impact Assessments*; The World Bank: Washington, DC, USA, 2002.
6. Office of Disease Prevention and Health Promotion. Environmental Health. In *Healthy People 2020*; ODPHP: Rockville, MD, USA. Available online: <https://www.healthypeople.gov/2020/topics-objectives/topic/environmental-health> (accessed on 29 October 2017).
7. Remoundou, K.; Koundouri, P. Environmental Effects on Public Health: An Economic Perspective. *Int. J. Environ. Res. Public Health* **2009**, *6*, 2160–2178. [CrossRef] [PubMed]
8. Morgan, R.K. Environmental Impact Assessment: The State of The Art. *Impact Assess. Proj. Apprais.* **2012**, *30*, 5–14. [CrossRef]
9. Cashmore, M. The Role of Science in Environmental Impact Assessment: Process and Procedure versus Purpose in the Development of Theory. *Environ. Impact Assess. Rev.* **2004**, *24*, 403–426. [CrossRef]
10. Linzalone, N.; Assennato, G.; Ballarini, A.; Cadum, E.; Cirillo, M.; Cori, L.; De Maio, F.; Musmeci, L.; Natali, M.; Rieti, S.; et al. Health Impact Assessment Practice and Potential for Integration within Environmental Impact and Strategic Environmental Assessments in Italy. *Int. J. Environ. Res. Public Health* **2014**, *11*, 12683–12699. [CrossRef] [PubMed]
11. Liu, L.; Liu, J.; Zhang, Z. Environmental Justice and Sustainability Impact Assessment: In Search of Solutions to Ethnic Conflicts Caused by Coal Mining in Inner Mongolia, China. *Sustainability* **2014**, *6*, 8756–8774. [CrossRef]
12. Harris, P.; Viliani, F.; Spickett, J. Assessing Health Impacts within Environmental Impact Assessments: An Opportunity for Public Health Globally Which Must Not Remain Missed. *Int. J. Environ. Res. Public Health* **2015**, *12*, 1044–1049. [CrossRef] [PubMed]
13. Withgott, J.; Wiggins, G.; Lisowski, M.; Scotchmoor, J.; Thanukos, A.; Pearson Education, Inc. Pearson Environmental Science: Boston, UK, 2011.
14. Ogala, P.F.A. Environmental Impact Assessment General Procedures. Available online: http://www.dphu.org/uploads/attachements/books/books_4491_0.pdf (accessed on 28 October 2017).
15. US Environmental Protection Agency (EPA), Office of Federal Activities. *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses*; Government Printing Office: Washington, DC, USA, 1998.
16. Jackson, T.; Illsley, B. An Analysis of the Theoretical Rationale for Using Strategic Environmental Assessment to Deliver Environmental Justice in The Light of the Scottish Environmental Assessment Act. *Environ. Impact Assess. Rev.* **2007**, *27*, 607–623. [CrossRef]
17. Glucker, A.N.; Driessen, P.P.J.; Kolhoff, A.; Runhaar, H.A.C. Public Participation in Environmental Impact Assessment: Why, who and how? *Environ. Impact Assess. Rev.* **2013**, *43*, 104–111. [CrossRef]
18. Sustainability and Environmental Justice: Air Pollution in Tonawanda (N.Y.) Sickens and Kills, According to Pending Civil Suits. Available online: <http://sustainabilityjjay.org/2015/02/air-pollution-in-tonawanda-n-y-sickens-and-kills-according-to-pending-civil-suits/> (accessed on 26 October 2017).
19. National Research Council. *Public Participation in Environmental Assessment and Decision Making*; The National Academies Press: Washington, DC, USA, 2008.
20. Sustain, C.R. *Designing Democracy: What Constitutions Do*; Oxford University Press: Oxford, UK, 2001.
21. Ventriss, C.; Kuentzel, W. Critical Theory and the Role of Citizen Involvement in Environmental Decision Making: A Re-Examination. *Int. J. Organ. Theory Behav.* **2005**, *8*, 520–540. [CrossRef]

22. World Bank. *The World Bank Participation Sourcebook*; World Bank: Washington, DC, USA, 1996.
23. The Rio Declaration on Environment and Development (1992). Available online: http://www.unesco.org/education/pdf/RIO_E.PDF (accessed on 13 December 2017).
24. United Nations Economic Commission for Europe. *Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters*; United Nations: Geneva, Switzerland, 1998.
25. Pollution Issues. Public Participation. Available online: <http://www.pollutionissues.com/Pl-Re/Public-Participation.html#ixzz51ky7wgmb> (accessed on 19 December 2017).
26. International Cooperation. Public Participation Guide: Introduction to Public Participation. Available online: <https://www.epa.gov/international-cooperation/public-participation-guide-introduction-public-participation> (accessed on 19 December 2017).
27. O’Faircheallaigh, C. Public Participation and Environmental Impact Assessment: Purposes, Implications, And Lessons for Public Policy Making. *Environ. Impact Assess. Rev.* **2010**, *30*, 19–27.
28. Beierle, T.C. Using Social Goals to Evaluate Public Participation in Environmental Decisions. *Policy Stud. Rev.* **1999**, *16*, 75–103. [CrossRef]
29. Institute of Medicine. *Toward Environmental Justice: Research, Education, and Health Policy Needs*; The National Academies Press: Washington, DC, USA, 1999.
30. Public Participation and Citizen Engagement. Effective Advising in State building and Peacebuilding Contexts—How. Available online: http://ipat-interpeace.org/wp-content/uploads/2015/10/2015_10_12_Effective_Advising_How-Public_participation.pdf (accessed on 21 December 2017).
31. National Academies of Sciences, Engineering, and Medicine. *Public Participation Strategies for Transit*; The National Academies Press: Washington, DC, USA, 2011.
32. Innes, J.E.; Booher, D.E. *Public Participation in Planning: New Strategies for the 21st Century*; Institute of Urban and Regional Development, University of California: Berkeley, CA, USA, 2000.
33. U.S. Energy Information Administration. New Mexico Profile Data, Reserves and Supply. Available online: <https://www.eia.gov/state/analysis.php?sid=NM#13> (accessed on 21 December 2017).
34. NETSTATE. New Mexico Economy. Available online: http://www.netstate.com/economy/nm_economy.htm (accessed on 21 December 2017).
35. New Mexico Energy, Minerals and Natural Resources Department, Renewable Energy Overview. Available online: <http://www.emnrd.state.nm.us/> (accessed on 21 December 2017).
36. U.S. EIA. *State Energy Production Estimates 1960 through 2014, Table P3, Energy Production and Consumption Estimates in Trillion Btu*; U.S. EIA: Washington, DC, USA, 2014.
37. U.S. Department of the Interior, Bureau of Land Management. *Public Land Statistics. 2015 (May 2016), Table 1–3, Mineral and Surface Acres Administered by the Bureau of Land Management, Fiscal Year 2015*; U.S. Department of the Interior, Bureau of Land Management: Washington, DC, USA, 2015; p. 7.
38. U.S. Department of the Interior; Bureau of Land Management; Oil and Gas Statistics. Table 6, Number of Producing Leases on Federal Lands. Available online: <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/oil-and-gas-statistics> (accessed on 29 October 2017).
39. New Mexico Energy Forum. Energy Facts. Available online: <http://www.nmenergyforum.com/expert-facts/> (accessed on 21 December 2017).
40. Independent Petroleum Association of New Mexico. *Energy New Mexico*; Independent Petroleum Association of New Mexico: Roswell, NM, USA, 2014; pp. 5–6.
41. U.S. EIA. Table 1, Top 100 U.S. Oil Fields as of 31 December 2013. In *Top 100 U.S. Oil and Gas Fields (March 2015)*; U.S. EIA: Washington, DC, USA, 2013; p. 6.
42. U.S. EIA. New Mexico Field Production of Crude Oil, Annual. Available online: <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=p&s=mcrfpm1&f=a> (accessed on 30 November 2017).
43. U.S. EIA. New Mexico Crude Oil Proved Reserves. Available online: <https://www.eia.gov/naturalgas/crudeoilreserves/> (accessed on 21 December 2017).
44. U.S. Forest Service. *Forest Service National Resource Guide to American Indian and Alaska Native Relations, Appendix D: Indian Nations, The American Indian Digest*; U.S. Forest Service: Washington, DC, USA, 1997; p. D-3.
45. Earth Data Analysis Center, University of New Mexico. Native Nation Lands, New Mexico. Available online: https://edac.unm.edu/2011/08/nm_native_lands/ (accessed on 1 June 2017).

46. U.S. Department of the Interior, Bureau of Indian Affairs. *Atlas of Oil and Gas Plays on American Indian Lands, Jicarilla Apache Indian Reservation, New Mexico, Reservation Overview, Introduction*; U.S. Department of the Interior, Bureau of Indian Affairs: Washington, DC, USA, 2002; p. 1. Available online: https://www1.eere.energy.gov/tribalenergy/guide/pdfs/jicarilla_apache.pdf (accessed on 8 December 2017).
47. Hailey Branson-Potts, Oklahoma Coming to Terms with Unprecedented Surge in Earthquakes, L.A. Available online: <http://www.latimes.com/nation/la-na-oklahoma-earthquakes-20140618-story.html#page=1> (accessed on 17 June 2014).
48. U.S. EPA. *Investigations of Groundwater Contamination near Pavillion, WY. Draft. EPA 600/R-00/000*; U.S. EPA: Washington, DC, USA, 2011.
49. Brady, W.J.; Crannel, J.P. Hydraulic Fracturing Regulation in the United States: The Laissez- Faire Approach of the Federal Government and Varying State Regulations. *Vt. J. Environ. Law* **2012**, *14*. [CrossRef]
50. Richardson, N.; Gottlieb, M.; Krupnick, A.; Wiseman, H.; The State of State Shale Gas Regulation. Resources for the Future 2013. Available online: http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-Rpt-StateofStateRegs_Report.pdf (accessed on 18 December 2017).
51. Richardson, J.J., Jr. Dillon's Rule is From Mars, Home Rule is From Venus: Local Government Autonomy and the Rules of Statutory Construction. *Publius* **2010**, *41*, 662–685. [CrossRef]
52. Krane, D.; Rigos, P.N.; Hill, M.B., Jr. *Home Rule in America: A Fifty-State Handbook*; Congressional Quarterly, Inc.: Washington, DC, USA, 2001.
53. Lange, E. Local Control of Emerging Energy Sources: A Due Process Challenge to Disparate Treatment by States. *Case West. Law Rev.* **2013**, *64*, 619.
54. Broadhead, R. Overview of Selected Shale Plays in New Mexico. Search and Discovery Article #10627. 2014. Available online: http://www.searchanddiscovery.com/pdfz/documents/2014/10627broadhead/ndx_broadhead.pdf.html (accessed on 18 December 2017).
55. Hilson, C. Litigation against Fracking Bans and Moratoriums in the US: Exit, Voice and Loyalty. *Wm. Mary Envtl. L. Pol'y Rev.* **2016**, *40*, 745–768.
56. Ostermayer, G.M. Legal Tools for Local Control of Oil and Gas Development: Successes, Challenges, and Opportunities—Focusing on Select Eastern and Western U.S. States with Current and Potential Oil/Gas Development. Master's Thesis, University of Montana, Bozeman, MT, USA, 2015.
57. New Mexico Constitution (1991), Article 10, Section 6, Subsection D. Available online: <http://www.sos.state.nm.us/nmconst2017.pdf> (accessed on 21 December 2017).
58. King Flaherty, M. *Will Sandoval Choose Oil and Gas Over People?* Sierra Club: Rio Grande Sierran, NM, USA, 2017.
59. The Associated Press. Sandoval County Oil & Gas Ordinance Vote pushed to January. Available online: <http://www.kob.com/albuquerque-news/sandoval-county-commission-oil-gas-drilling-ordinance/4672227/> (accessed on 20 November 2017).
60. Water, Air & Land: A Sacred Trust. EPA Reaches Informal Resolution of Fifteen-Year-Old Civil Rights Complaint Against the New Mexico Environment Department. Available online: <http://sacredtrustnm.org/epa-nmed-come-to-settlement-agreement/> (accessed on 31 November 2017).
61. NM Stat § 3-21-3 (2015). Available online: <https://law.justia.com/codes/new-mexico/2015/chapter-3/article-21/section-3-21-3> (accessed on 27 December 2017).
62. Wouters, M.; Hardie-Boys, N.; Wilson, C. *Evaluating Public Input in National Park Management Plan Reviews: Facilitators and Barriers to Meaningful Participation in Statutory Processes*; Department of Conservation: Wellington, New Zealand, 2011.
63. United States Environmental Protection Agency (USEPA). 09R-02-R6 NMED Resolution Letter and Agreement. Available online: <https://www.epa.gov/sites/production/files/2017-01/documents/final-resolution-letter-and-agreement-triassic-park-recipient-1-19-2017.pdf> (accessed on 27 December 2017).
64. Ingram, V.; Adviser, S. Book Review: "Communication and Public Participation in Environmental Decision-Making", Stephen P. Depoe, John W. Delicath and Marie-France Aepli Elsenbeer (Eds.). *J. Environ. Assess. Policy Manag.* **2006**, *8*, 107–109. [CrossRef]
65. Israel, B.A.; Eng, E.; Schulz, A.J.; Parkers, E.A. *Methods in Community—Based Participatory Research for Health*; Jossey-Bass: San Francisco, CA, USA, 2005.
66. Minkler, M.; Wallerstein, N. *Community-Based Participatory Research for Health*, 2nd ed.; Jossey-Bass: San Francisco, CA, USA, 2008.

67. Kano, K.; Willging, C.E.; Rylko-Bauer, B. Community Participation in New Mexico's Behavioral Health Care Reform. *Med Anthropol Q.* **2009**, *23*, 277. [[CrossRef](#)] [[PubMed](#)]
68. Stringer, E.T. *Action Research*, 3rd ed.; Sage: Thousand Oaks, CA, USA, 2007.
69. Gaventa, J.; Cornwall, A. Power and Knowledge. In *The SAGE Handbook of Action Research: Participative Inquiry and Practice*, 2nd ed.; Sage: London, UK, 2008; pp. 172–190.
70. Hampshire, K.; Hills, E.; Iqbal, N. Power Relations in Participatory Research and Community Development: A Case Study from Northern England. *Hum. Organ.* **2005**, *64*, 340–349. [[CrossRef](#)]
71. Wallerstein, N. Power between Evaluator and Community: Research Relationships within New Mexico's Healthier Communities. *Soc. Sci. Med.* **1999**, *49*, 39–53. [[CrossRef](#)]
72. Butterfoss, F.D. *Coalitions and Partnerships in Community Health*; Jossey-Bass: San Francisco, CA, USA, 2007.



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